

CLAIMS

1. Drive device for the adjustment of an actuating element of a throttle, valve, connection device, dosage feed device or similar device, in particular in the production of oil or gas, the drive device comprising:
at least one spindle drive movably connected to the actuating element and a gear unit arranged between the spindle drive and at least one motor; the gear unit exhibiting a reduction gear assigned to the spindle drive, and a spur gear assigned to the motor .
2. Drive device according to claim 1, wherein the spindle drive is a recirculating roller or ball spindle drive with a spindle nut and threaded spindle.
3. Drive device according to claim 2, wherein the spindle nut is supported rotationally, but axially immovably in a device housing.
4. Drive device according to claim 2, wherein the spindle nut is supported rotationally rigidly, but axially movably in a device housing.
5. Drive device according to claim 2, wherein the spindle nut or threaded spindle is rotationally rigidly connected to the reduction gear.
6. Drive device according to claim 1, wherein the reduction gear exhibits as a harmonic drive gear a flexible, cup-shaped toothed sleeve, a fixed ring element and a wave generator, whereby the toothed sleeve partially engages the inner teeth of the ring element with its outer teeth and the wave generator is arranged inside the toothed sleeve.
7. Drive device according to claim 6, wherein the toothed sleeve is rotationally rigidly connected to the spindle nut or the threaded spindle.
8. Drive device according to claim 6, wherein a rotationally supported, but axially immovable connecting sleeve is arranged between the toothed sleeve and the spindle drive.
9. Drive device according to claim 8, wherein the threaded spindle is rotationally rigidly inserted with its drive end into a retention hole of the connecting sleeve.

10. Drive device according to claim 9, wherein splines are formed between the threaded spindle and the inner side of the retention hole.
11. Drive device according to claim 1, wherein the spur gear is helically toothed.
12. Drive device according to claim 1, wherein the spur gear is formed as a double helical gear.
13. Drive device according to claim 6, wherein the reduction gear and in particular its wave generator are movably connected to a first spiral toothed gear wheel and the motor to a second spiral toothed gear wheel of the spur gear.
14. Drive device according to claim 13, wherein the second spiral toothed gear wheel is arranged on a drive shaft of the motor.
15. Drive device according to claim 14, wherein two or more motors are assigned to the drive shaft.
16. Drive device according to claim 2, wherein two or more drive shafts each with at least one motor are essentially supported in parallel to the threaded spindle in the device housing.
17. Drive device according to claim 16, wherein a second spiral toothed gear wheel, which engages the first spiral toothed gear wheel, is arranged on each drive shaft.
18. Drive device according to claim 1, wherein each motor is an electric motor.
19. Drive device according to claim 13, wherein a helix angle of the helical tooth arrangement of the first and / or second spiral toothed gear wheel lies in the range from 50° to about 90° and in particular in the range from 65° to 85°.

20. Drive device according to claim 1, wherein the transmission ratio of the spur gear is between $i=25$ and $i<1$.
21. Drive device according to claim 13, wherein the first and second spiral toothed gear wheel exhibit 1 to 10, preferably 1 to 7 and especially preferred 1 to 4 teeth.
22. Drive device according to claim 8, wherein the connecting sleeve is releasably connected at its end facing away from the spindle drive to the toothed sleeve.
23. Drive device according to claim 2, wherein at least one engaging element protrudes essentially radially outwards from the threaded spindle or the spindle nut and engages slots of a fixed sleeve and a rotating sleeve, whereby a first slot extends essentially in the axial direction and a second slot extends at an acute angle to the first slot.
24. Drive device according to claim 23, wherein the actuating element can be rotated together with the rotating sleeve.
25. Drive device according to claim 1, wherein a position sensor is assigned to an axially movable part of the spindle drive.
26. Drive device according to claim 1, wherein a position sensor is assigned to a rotating part of the spindle drive.
27. Drive device according to claim 2, wherein a position sensor includes an essentially flat code carrier, which is offset radially outwards with respect to the threaded spindle and arranged parallel to it.

28. Drive device according to claim 27, wherein a dog is arranged between an axially movable part of the spindle drive, in particular between its engaging element and the code carrier.
29. Drive device according to claim 4, wherein a distance sleeve is arranged in a motor hole of the device housing on a side, facing away from a spiral toothed gear wheel, of the at least one motor.
30. Drive device according to claim 4, wherein the device housing is of modular construction.
31. Drive device according to claim 27, wherein the code carrier is guided in the axial direction in a guide sleeve.
32. Drive device according to claim 3, wherein the threaded spindle and the spindle nut are supported together rotationally in the device housing.
33. Drive device according to claim 2, wherein the threaded spindle is releasably connected at its end facing away from the spindle nut to a sliding rod of the actuating element.
34. Drive device according to claim 27, wherein the code carrier of the position sensor is inserted at least with one end section in an internal hole of the threaded spindle and is releasably attached there for common movement of the code carrier and threaded spindle in the axial direction.
35. Drive device according to claim 8, wherein the spindle nut and the connecting sleeve are releasably connected to one another.
36. Drive unit according to claim 1 wherein the reduction gear assigned to the spindle drive is a harmonic drive gear.

37 Drive unit according to claim 1 wherein the spur gear assigned to the motor is self-locking.